ANALYSIS AND RECOMMENDATIONS

As noted earlier in this report, the Chesapeake Bay Local Assistance Board (CBLAB) has determined that the County's Comprehensive Plan is consistent with the Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations, subject to a condition that the County undertake and complete recommendations addressing several issues. This section of the report provides a brief analysis of considerations associated with these issues and presents a series of recommended actions to address each of the major issues identified by CBLAB. The following five key subject areas are identified: Water Pollution Sources; Infill Development; Redevelopment; Shoreline Erosion Control; and Shoreline Access. Each recommended action is numbered, with the numbers continuing sequentially from one subject area to the next. The intent of the recommendations is to identify actions that are related to the issues identified by CBLAB (as discussed in this report) or that are associated with related Comprehensive Plan policy and not otherwise addressed through other County initiatives. As noted in the previous section of this report, there are a number of environmental initiatives that have been pursued recently by the County, and many of these initiatives have presented a series of recommended policy and/or implementation actions. Of particular note are: the Board of Supervisors' recently adopted Environmental Agenda/Environmental Excellence 20-year Vision Plan; the Infill and Residential Development Study (discussed below); the Regional Pond Subcommittee report; the report of the New Millennium Occoquan Watershed Task Force; and ongoing watershed management planning efforts. While many of the recommendations in this report reference, overlap with, or parallel these efforts, it is not the intent of this section to comprehensively repeat the many water quality recommendations that have been identified (and, in the case of watershed management planning, continue to be identified).

Policy issues have been addressed through an amendment to the Policy Plan that has been considered concurrently with this Comprehensive Plan supplement. As such, the focus of the recommendations in this section is on actions that can serve to support adopted County policies. The new policies that have been considered concurrently with this supplement include the following:

- A policy supporting watershed management planning and recommending the consideration of any adopted or endorsed watershed management plan as a factor in making land use decisions;

- A policy recommending optimization of stormwater management and water quality controls and practices for redevelopment consistent with revitalization goals;

- A policy recommending: (1) remediation of development and redevelopment sites that have been subject to contamination by toxic substances or other hazardous materials to the extent that they will not present unacceptable health or environmental risks for the specific uses proposed for these sites, and (2) that unacceptable health or environmental risks will not occur as a result of contamination associated with nearby properties;

- A policy incorporating the map of Chesapeake Bay Preservation Areas presented earlier in this report (Figure 5) into the Plan by reference;

- A policy supporting the analysis and recommendations presented in this document;

- A policy recommending that tidal shoreline erosion control practices follow guidelines of the Virginia Marine Resources Commission, the Virginia Institute of Marine Science, and the Shoreline Erosion Advisory Service and that a hierarchy or preferred shoreline erosion control practices be followed that is generally consistent with guidance endorsed by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance;

- A policy recommending that tidal shoreline access structures follow guidelines of the Chesapeake Bay Program and Virginia Marine Resources Commission; and

- A policy supporting wetland mitigation efforts that are pursued near the area(s) of impact.

Appendix B presents this and other Comprehensive Plan text that is related to water quality protection and identifies the linkages between the actions recommended in this section and Comprehensive Plan policy.

WATER POLLUTION SOURCES

FINDINGS

Water resources in Fairfax County are vulnerable to contamination and degradation from both point and nonpoint sources. The primary threat to the County's water resources is associated with stormwater runoff from developed and developing areas. However, significant reductions in nutrient loads from both point and nonpoint sources will need to be pursued in Fairfax County in support of regional efforts to restore habitats for living resources in the Potomac River and the Chesapeake Bay (the Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy for the Shenandoah and Potomac River Basins). Where the County contributes to point source waste loads in other jurisdictions (i.e., discharges from sewage treatment plants at Blue Plains, in the City of Alexandria, and in Arlington County), contributions to plant upgrades or other efforts to counter increasing pollutant loads associated with continued increases in wastewater volumes generated in the County may be needed. The consideration of efforts that may be needed to support the Tributary Strategy effort falls beyond the scope of this document; however, it should be recognized that this effort will be an expensive one with significant implications to Fairfax County, in terms of the funding that will be needed to support pollutant load reductions and perhaps in terms of future growth and development in the County and region.

Most of Fairfax County has been developed, and relatively little land remains vacant. While redevelopment can be anticipated in many areas of the County, the prevailing character of land use over much of the County is, and will remain, a stable one. Stormwater management controls for new development and redevelopment can, therefore, only assist efforts to reduce pollutant

loads in a relatively limited manner. Rather, water quality improvement efforts that fall outside the realm of governmental regulation, including voluntary stewardship efforts on the part of residential, business, and institutional land owners, will become increasingly important, as will proactive efforts to provide water quality controls in areas where such controls have been lacking. The County's watershed management planning initiative will serve to identify opportunities to pursue water quality improvement projects as well as projects to improve the ecological vitality of the County's streams. The watershed management planning effort should also encourage a broader stewardship ethic through increased citizen involvement in watershed initiatives. Indeed, the program's receipt of the National Association of Counties' 2004 Achievement Award attests to the breadth of this effort. Substantial additional educational efforts, however, will probably be needed to reach a broader cross-section of the County's land owners and managers.

Fairfax County contains significant areas of publicly-owned land; federally-owned properties (e.g., U.S. Army Fort Belvoir, the George Washington Memorial Parkway, Washington Dulles International Airport) are of particular note, but significant areas are also owned and managed by the Northern Virginia Regional Park Authority and the State. Development on state and federal lands generally falls outside of the County's regulatory authority; however, environmentally-sensitive development practices are as important on these properties as they are on properties that are subject to County approval. In addition, development activities in adjacent jurisdictions can affect the quality of the County's water resources, and the County therefore has an interest in activities that occur beyond its borders.

Fairfax County does not contain substantial areas characterized by traditional "heavy" industrial uses. Those activities that do have significant discharges into the surface water system are subject to permitting requirements and enforcement by Virginia's Department of Environmental Quality. Facilities that use or store significant quantities of hazardous materials or that store petroleum products in underground storage tanks are well regulated at the County, State, and federal levels. Further, the County's Policy Plan contains a policy recommending protection of water resources through the maintenance of high standards for discharges from point sources, and it is not anticipated that a significant number of new point source dischargers will be established within Fairfax County in the future. However, if a facility subject to VPDES permitting is also the subject of a request for a zoning approval, it would be prudent to review the facility's permit compliance status during the course of the review of the zoning application and to ensure that any shortcomings in facility performance are remedied. Further, while underground storage tanks are well regulated, residential heating oil tanks are not subject to registration requirements, and the Virginia Department of Environmental Quality has indicated that a significant proportion of the total number of petroleum releases in Fairfax County is related to residential heating oil tanks. This issue cannot be resolved through land use controls or policies; absent strengthened regulation of these tanks, increased outreach and education efforts would probably be needed to improve the maintenance and monitoring of these tanks.

An issue of more significant concern regarding hazardous materials and underground storage tanks is that of residual contamination associated with past activities on a site. This concern is discussed in the analysis of redevelopment issues.

As noted earlier, one emerging water resource issue related to land use concerns, as highlighted in the recent report of the New Millennium Occoquan Watershed Task Force, concerns on-site sewage disposal systems. Specifically, this concern relates to the increasing number of technologically advanced, but maintenance-intensive, on-site sewage disposal systems that are coming into use. An interagency County staff subcommittee has begun to explore solutions to issues posed by these new systems, including a review of the feasibility of establishing a self-supporting authority to provide for the maintenance of on-site sewage disposal systems.

As evidenced by the results presented within the Stream Protection Strategy Baseline Study, the Countywide Stream Physical Assessment, and the annual Stream Water Quality Report, water resources throughout the County have been stressed by the effects of land use and development. A direct correlation between watershed imperviousness and the ecological integrity of streams in Fairfax County has been identified. Adverse stream conditions such as bank erosion, obstructions, dump sites, and insufficient riparian buffers have been documented throughout the County. Fecal coliform bacteria concentrations typically exceed regulatory standards, and a growing list of "impaired waters" in Fairfax County is being compiled by VDEQ. At the regional level, substantial and costly efforts will be needed to restore high quality living resource conditions to the Chesapeake Bay and its tidal tributaries, and Fairfax County will need to contribute to this regional effort.

The County's Policy Plan recognizes the need to "prevent and reduce pollution of surface and groundwater resources," to "protect and restore the ecological integrity of streams in Fairfax County," and to protect the Potomac Estuary and the Chesapeake Bay from the avoidable impacts of land use activities in Fairfax County." While water resource issues affecting the County are numerous, efforts are under way to address these issues. The County has initiated a comprehensive watershed management planning program to identify stream restoration needs and strategies and to establish priorities for action. Coordinated efforts are under way to develop strategies to address fecal coliform bacteria pollution in Accotink Creek and Four Mile Run, and similar efforts will need to be pursued for other impaired waters in and near the County. The County will continue to devote significant resources to the enforcement of its erosion and sediment control requirements. Further, the County is in the process of reviewing its stormwater management requirements to identify changes that will be needed to optimize the effectiveness of these requirements in protecting and restoring the County's water resources. Policies have been adopted to support better site design and low impact development techniques where appropriate, and discussions are continuing as to how to integrate these techniques more completely into the County's regulatory framework.

Other efforts of note include the recent adoption of Policy Plan language to support wetland compensation and mitigation efforts near the area(s) of wetland impacts. Staff from the Fairfax County Department of Public Works and Environmental Services has coordinated with the U.S. Army Corps of Engineers to identify watershed restoration opportunities in Fairfax County that can be sought as compensation for wetland losses in the County based on the recently-completed Countywide Stream Physical Assessment project. The County is participating in and closely tracking efforts to develop basin-wide strategies to reduce nutrient and sediment inputs into the Potomac River and Chesapeake Bay. The County also participates in the regional Occoquan

Basin Nonpoint Pollution Management Program and the Four Mile Run Watershed Management Program coordinated through the Northern Virginia Regional Commission.

The protection of the County's tree cover can also be considered as a significant water quality strategy; trees can intercept and slow considerable quantities of rain water, thereby reducing stormwater runoff, associated erosion, and the conveyance of nonpoint source pollutants. In addition, trees and forests, particularly where interconnected in large, contiguous areas and corridors, provide considerable wildlife habitat benefits. The County is currently identifying and mapping the locations and extents of all native forest communities present in Northern Virginia, including upland and riparian forests. The delineation of forest communities will allow the County to identify vegetation that is becoming rare or endangered on a global or local basis and to consider this information in land use decisions and watershed management planning efforts. This information could also be used to establish specific tree cover goals and strategies (that could be watershed based) in order to optimize the benefits of tree cover and forests.

The County has identified a large number of storm drainage projects that are needed to remedy drainage and environmental concerns. As the watershed management planning, TMDL development and implementation, and basin-wide strategies at the regional level are developed, this list can be expected to grow, and the already substantial hurdle of funding will become even more of a challenge. While policy decisions regarding funding mechanisms extend beyond the purview of this document, the County will need to consider how resources can be obtained to address a multitude of water resource protection and restoration needs and how to optimize these resources. Meanwhile, the Policy Plan has been amended to incorporate policy support for the County's primary nonpoint source initiative (watershed management planning), and to support the consideration of watershed management plans as a factor in land use decisions. Continued efforts are recommended to ensure:

- that the County's information base supports water resource management initiatives;

- that the County's stormwater management practices and requirements (e.g., regional ponds, low impact development measures, adequate outfall requirements) support water resource protection and restoration to the extent possible;

- that the County's staffing levels are adequate to meet state-mandated erosion and sediment control review and inspection requirements and adequate to protect downstream properties and the County's natural resources from erosion and sedimentation associated with land-disturbing activities; and

- that the County participates in regional water resource management initiatives.

WATER POLLUTION SOURCES: RECOMMENDATIONS

1. If and when facilities that are subject to Virginia Pollutant Discharge Elimination System (VPDES) permits request zoning approvals, coordinate with the Virginia Department of Environmental Quality to identify any shortcomings in permit compliance and seek remedies to any such shortcomings.

2. Review the County's current approach to adequate outfall and revise if necessary to ensure protection of downstream resources when development occurs. If determined to be appropriate, prepare an amendment to the Public Facilities Manual to revise adequate outfall requirements.

3. Complete watershed management plans for all 30 of the County's watersheds.

4. Watershed management plans are currently being developed, and it can be anticipated that these plans will ultimately be adopted by the Board of Supervisors. Develop a mechanism to ensure that zoning and Plan amendment proposals will be reviewed within the context of adopted watershed management plans; establish standard operating procedures to ensure that the necessary interagency coordination occurs.

5. Implement the recommendations of adopted watershed management plans as funding allows. Establish a mechanism to prioritize and track actions on recommendations for capital improvement projects. Once a sufficient number of watershed management plans have been completed, establish a work program for the consideration of policy and regulatory changes to address policy actions recommended in adopted watershed management plans.

6. Explore the feasibility and desirability of establishing a self-supporting funding mechanism to provide for the implementation of projects recommended through the watershed management planning process. Present recommendations regarding funding mechanisms to the Board of Supervisors for consideration.

7. Consider the establishment of an obtainable tree cover goal for Fairfax County and/or some or all watersheds within Fairfax County. Prepare a recommended process to develop such a goal (or goals) for consideration by the Board of Supervisors.

8. Coordinate with the Natural Resources Conservation Service and the Northern Virginia Soil and Water Conservation District on the completion of a revised soil survey for Fairfax County.

9. Continue participation in the regional Occoquan Watershed management program.

10. Coordinate with neighboring jurisdictions to foster cooperation on regional water resource issues and request the participation of neighboring jurisdictions on applicable watershed management planning efforts. Continue to review and provide comments on development proposals outside of the County's boundaries that can affect the County's natural resources.

11. Continue to analyze and comment on land use and development activities proposed on federal, state, or other publicly-owned land that falls outside of the County's regulatory authority; through such comments and associated coordination, encourage development designs and practices that are consistent with the Comprehensive Plan.

12. Explore the feasibility and desirability of establishing a self-supporting authority to provide for the management of on-site sewage disposal systems. Present recommendations regarding such an authority to the Board of Supervisors.

13. Amend the Public Facilities Manual to incorporate standards for Low Impact Development Best Management Practices (BMPs) and other innovative BMP practices as appropriate.

14. Consider whether changes to County policies regarding the placement of Low Impact Development BMP practices should be revised to allow for a broader application of such practices on individual privately-owned lots. Present recommendations regarding this matter to the Board of Supervisors.

15. Review the County's policies and Code requirements to determine if changes to the Public Facilities Manual, Zoning Ordinance, and/or other Code requirements would be appropriate consistent with Policy k of Objective 2 in the Environment section of the Policy Plan (supporting the application of better site design and low impact development techniques). Prepare appropriate amendments to these requirements for consideration by the Planning Commission and Board of Supervisors.

16. Contingent on the availability of sufficient funding, retrofit existing stormwater management facilities to enhance their water quality and quantity control functions; continue to retrofit dry stormwater management facilities as wetland BMP facilities.

17. Ensure that appropriate interagency coordination occurs in order to improve the consideration of stormwater management, BMP, and adequate outfall issues during the zoning process.

18. Ensure that appropriate interagency coordination occurs in order to improve the consideration of stormwater management, BMP and adequate outfall issues during the Plan amendment process.

19. Revisit the current policy supporting the use of regional stormwater management facilities in light of the approach recommended in the March, 2003 report entitled “The Role of Regional Ponds in Fairfax County’s Watershed Management.” Prepare an amendment to the Comprehensive Plan to revise County policy as it relates to regional facilities for consideration by the Planning Commission and Board of Supervisors.

20. Coordinate with the Virginia Department of Environmental Quality and other entities as appropriate on the development of TMDLs and implementation plans for impaired waters in Fairfax County.

21. Coordinate with appropriate state agencies on the development of nutrient and sediment reduction strategies for the Shenandoah and Potomac River Basin.

22. Continue to pursue implementation of recommendations presented in the report of the New Millennium Occoquan Watershed Task Force.

23. Ensure that sufficient resources continue to be dedicated to the enforcement of erosion and sediment control requirements.

24. Continue to implement the County's infiltration abatement program to maintain the integrity of the County's sanitary sewer network.

25. Inform authorities responsible for wetland regulation of the County policy supporting wetland compensation and mitigation efforts near the area(s) of impact and request their consideration in implementing this policy through their permitting processes.

26. Continue existing nonpoint source pollution education efforts and, contingent on the availability of resources, strengthen outreach efforts to improve the land stewardship ethic among owners and managers of land in Fairfax County. Consistent with recommendations presented by the New Millennium Occoquan Watershed Task Force, pursue strengthened partnerships with appropriate public, nonprofit, and citizen organizations, encourage growth in the network of organizations and citizens groups concerned with and/or actively involved in watershed and water quality issues, sponsor/partner on an increased number of efforts to promote water quality and natural resource protection, and expand existing outreach and education programs.

27. Contingent on the availability of resources, strengthen outreach efforts to property owners with residential heating oil tanks to encourage improved maintenance, monitoring, and operation of these tanks.

28. Conduct concurrent reviews and public hearings for exceptions from Chesapeake Bay Preservation Ordinance requirements in conjunction with other land use approval processes involving public hearings before the Planning Commission and Board of Supervisors.

INFILL DEVELOPMENT

FINDINGS

As noted in the first section of this report, the amount of vacant land in the County has decreased steadily as population and employment have increased. In 2003, only 11.1% of the County's zoned land was vacant, and large, contiguous blocks of vacant land are no longer prevalent. More and more, new development is characterized by the "infill" of new construction on relatively small parcels of vacant or underutilized land in established, developed areas. Redevelopment of older areas is also becoming more common. The Infill and Residential Development Study was initiated by the Board of Supervisors in May, 1999 in recognition of the unique challenges posed by infill development. A study report was published in July, 2000, and the recommendations of this report were accepted by the Board of Supervisors subsequent to a

public hearing that was held on January 22, 2001. One of the major thematic areas covered by the report addressed stormwater management and erosion and sediment control. The effectiveness of policies and practices regarding stormwater management and erosion and sediment control were reviewed with regard to their effectiveness in minimizing impacts of stormwater runoff on downstream properties, limiting the impacts of stormwater management facilities on neighborhoods, ensuring that developers are accountable for impacts from their developments, and upgrading existing inadequate facilities. Some of the recommendations presented included:

- An enhanced erosion and sediment control program involving improvements in education, policy, regulations, and enforcement as well as implementation of innovative practices;

- Adoption of policies regarding innovative BMP practices in order to reduce impact during development and allow greater flexibility in the engineering of proposed sites;

- Improved consideration of proposed storm water management facilities by implementing a technical review of certain components during the rezoning process;

- Enhanced requirements and better definitions for design professionals for evaluating the adequacy of stream channels for increased runoff due to new developments during the design process;

- Identification and survey of water impoundments downstream of a proposed development that could be impacted by a proposed development, and assignment of accountability for impact resolution;

- Adoption of a program to retrofit existing non-water quality control facilities to perform this function as well; and

- Development of a BMP monitoring program.

Other sections of the Infill and Residential Development Study addressed site compatibility, tree preservation, and traffic and transportation. While water quality considerations were not the primary factor influencing the recommendations that were issued in these sections of the report, a number of recommendations in these sections have water quality implications. Of particular note are the following:

- Revisions to the Residential Development Criteria of the Policy Plan (which have been used to assess residential density during the review of zoning applications)—these criteria include a consideration of environmental resources and impacts;

- Consideration of whether cluster development should be allowed “by-right”—the Board of Supervisors did not accept or reject a staff position on this issue, but State legislation

adopted subsequent to the Board's consideration of the Infill and Residential Development Study has required action to be taken to address this issue.

- Consideration of how "open space" is defined in the Zoning Ordinance to ensure that open space that is identified on development plans provides neighborhood benefits such as recreational opportunities or tree preservation.

- Revision to the method of calculating required stormwater retention in the Public Facilities Manual to provide an incentive for additional tree preservation.

- Support for the use of conservation easements on common open space areas to provide for the protection, in perpetuity, of forested areas.

Implementation of these recommendations is continuing; some of the recommendations have been implemented, while others are in progress. Recently, substantial progress has been made in the following key areas:

- Improvement in the ability of County staff to enforce erosion and sediment control requirements through the development of a "Violation Matrix." This matrix provides staff with a better tool to enforce erosion and sediment control requirements and provides industry with a more predictable path toward resolution of violations.

- Continued analysis of measures and methods to improve the efficiency and capabilities of erosion and sediment controls, including the drainage area to temporary inlets and the use of devices such as the Faircloth Floating Skimmer, chemical erosion prevention products, and bonded fiber matrix products.

- Establishment of a committee comprised of staff and industry professionals, in conjunction with the Engineers and Surveyors Institute, (ESI) to review and evaluate the current adequate outfall provisions. It is intended that this effort will result in recommendations for policy and regulatory changes to improve how the County addresses issues associated with storm drainage outfalls from developed and developing sites.

- Adoption of an amendment to the Zoning Ordinance to require more detailed information during the zoning process regarding stormwater management facilities and outfall conditions. In conjunction with the implementation of the strengthened submission requirements, staff is developing an internal review process that will ensure a more rigorous consideration of stormwater management, adequate outfall, and water quality issues during the zoning process.

- Adoption of an amendment to the Policy Plan to revise the Residential Development Criteria. These revised criteria include strengthened guidance regarding water quality issues, including a consideration of impacts to off-site properties, the provision of state-of-the-art stormwater management measures, and the pursuit of better site design and low

impact development techniques.

- Adoption of an amendment to the Policy Plan to promote the use of open space/conservation easements as tools to preserve environmental resources.

- Adoption of an amendment to the Zoning Ordinance to allow cluster subdivisions "by-right" in certain residential zoning districts, subject to performance criteria ensuring preservation of environmentally-sensitive areas such as floodplains and adjacent steeply sloping areas and requiring tree cover requirements to be met through tree preservation where appropriate.

One of the conditions imposed by the Chesapeake Bay Local Assistance Board in its review of the County's Comprehensive Plan for conformance with the Chesapeake Bay Preservation Area Designation and Management Regulations was the following: "The County shall revise the Plan, where appropriate, to develop policies that address the recommendations that affect water quality as outlined in the 'Infill and Residential Development Study'." While it is recognized that the implementation of recommendations in this study is not yet complete, such efforts are continuing. Further, remaining implementation tasks related to the recommendations of the Infill and Residential Development Study relate to regulatory and procedural issues. The Policy Plan has been amended to incorporate revised residential development criteria and to support the use of open space/conservation easements, and the existing policy framework within the Policy Plan supports the remaining tasks.

Another concern related to infill development projects is the potential for soil and/or groundwater contamination associated with past and/or current activities on adjacent properties. While it is not generally the responsibility of a developer to remediate contamination caused by current or past uses on an adjacent or nearby property, it is appropriate to ensure that any development that occurs on an infill site will not present unacceptable health or environmental risks, either to workers on the site or to occupants of the developed site. A policy to this effect (more broadly applicable to all development sites) has been incorporated into the Environment section of the County's Policy Plan; site investigations may be needed in cases in order to identify potential contaminants on infill development sites.

INFILL DEVELOPMENT: RECOMMENDATIONS

Many of the recommendations above that address water pollution sources also address infill development; some were referenced directly in the Infill and Residential Development Study. These recommendations are not repeated here.

29. Continue to implement the recommendations of the Infill and Residential Development Study as accepted by the Board of Supervisors on January 22, 2001.

30. Incorporate Virginia Department of Environmental Quality (VDEQ) data regarding leaking storage tanks into the Department of Planning and Zoning's environmental assessment application to ensure that contamination on or near sites where such

releases have occurred is considered appropriately during the consideration of infill development and redevelopment proposals during the zoning process. (Same as #32)

31. Coordinate with VDEQ regarding the acquisition of information regarding other releases of contaminants (e.g., the Volunteer Remediation Program) in order to better screen for potential site contamination issues during the zoning process. (Same as #33)

REDEVELOPMENT

FINDINGS

As noted earlier in this report, the character of development in Fairfax County has changed substantially over time. Infill development on relatively small parcels of vacant and underutilized land in established, developed areas has become common, and redevelopment of older areas, either through wholesale neighborhood consolidation and redevelopment or through redevelopment on individual lots or parcels, is becoming a more common occurrence. Redevelopment is actively encouraged in many areas; in fact, the revitalization of older commercial and residential areas of the County is established as one of the Board of Supervisors 19 "Goals for Fairfax County." The County has established Commercial Revitalization Districts and Areas and has developed specific zoning provisions and Comprehensive Plan guidance for these areas. Redevelopment is considered to be a welcome result of the economic vitality of Fairfax County and is, under appropriate circumstances, embraced and encouraged by the County. However, redevelopment presents an entirely new set of concerns and opportunities beyond those typically associated with new development, and these concerns and opportunities cut across environmental, economic, and social lines.

From an environmental perspective, redevelopment offers significant opportunities to support the restoration of areas that have been degraded by previous development. There are opportunities to convert sites that are now largely impervious with no water quality controls to economically vibrant developments on sites with reduced impervious cover and new stormwater management and water quality controls. Efforts to reduce the effective impervious cover of these sites through the application of "better site design" practices can also be considered. Further, efforts to restore segments of degraded streams and their riparian buffer areas may be possible, even in some of the most intensely developed areas of the County. The County's Policy Plan supports the restoration of the County's streams, the restoration of degraded Environmental Quality Corridors, the reduction of pollution of surface and groundwater resources, and the application of better site design techniques on redevelopment sites. In addition, broader guidance recognizing water quality opportunities associated with redevelopment has been incorporated into the Plan. From a regulatory perspective, the County's Chesapeake Bay Preservation Ordinance requires reductions in phosphorus runoff for redevelopment projects; however, there is no parallel requirement addressing stormwater quantity controls.

Another concern related to redevelopment projects is the potential for residual soil and/or groundwater contamination associated with past activities on the subject properties. It is appropriate to ensure that any development that occurs on a redevelopment site will not present

unacceptable health or environmental risks, either to workers on the site or to occupants of the developed site. A policy to this effect has been incorporated into the Environment section of the County's Policy Plan. The concern in this area is two-fold:

(1) There may be no obvious signs of contamination on a property that has, in fact, been contaminated by past activities; and

(2) Risk factors associated with sites that have been "cleaned up" can change as these sites are redeveloped; what may be an acceptable level of risk for a commercial or industrial use, for example, may not be acceptable for a residential or other more sensitive use.

The first concern can be addressed through site investigations focusing on historical uses of properties and, if appropriate, soil and/or groundwater monitoring. While these investigations are not required by the County Code, they are typically sought during the zoning process on sites where the potential for releases of contaminants has been identified. The incorporation of VDEQ data regarding leaking storage tanks (both open and closed cases involving underground or above ground tanks), as presented earlier in this document, would assist in this effort.

With respect to properties on which redevelopment is proposed, County staff typically requests, during the zoning process, site investigation information and/or commitments where there is evidence or concern of potential site contamination; such requests have been made where there is physical evidence of contamination on a site (e.g., odors; stressed vegetation; staining of soil; empty 55-gallon drums) and even in some cases where the proposed nature of the change in zoning (e.g., from industrial to residential) evokes concerns about site history and potential implications with respect to the proposed use. Typically, the Department of Planning and Zoning coordinates such requests with the County's Fire and Rescue and Health Departments. The consideration of DEQ data regarding open and closed cases regarding leaking storage tanks would further assist in this effort, as would broader coordination with DEQ on the identification of sites for which there are records of past contamination (e.g., the State's Voluntary Remediation Program.)

REDEVELOPMENT: RECOMMENDATIONS

Many of the recommendations identified earlier (addressing water pollution sources) also address redevelopment. These recommendations are not repeated here.

32. Incorporate Virginia Department of Environmental Quality (VDEQ) data regarding leaking storage tanks into the Department of Planning and Zoning's environmental assessment application to ensure that contamination on or near sites where such releases have occurred is considered appropriately during the consideration of infill development and redevelopment proposals during the zoning process. (Same as #30)

33. Coordinate with VDEQ regarding the acquisition of information regarding other releases of contaminants (e.g., the Volunteer Remediation Program) in order to better screen for potential site contamination issues during the zoning process. (Same as #31)

34. Develop recommendations for amendments to the County Code and/or Public Facilities Manual, as applicable, to consider the establishment of stormwater management requirements for redevelopment that will provide for reduced stormwater runoff peak volumes on developed sites that are currently not adequately served by such measures. Draft these recommendations in a manner that will allow for the consideration of whether to require redevelopment sites to achieve a certain reduction in peak volumes rather than allowing them to achieve the same hydrologic conditions that existed prior to redevelopment. The County already has a BMP requirement for redevelopment (a 10% reduction in phosphorus runoff compared with pre-redevelopment conditions); a requirement that is similar in nature to the BMP requirement could be pursued for stormwater quantity control.

SHORELINE EROSION CONTROL

FINDINGS

In order to update existing published information regarding shoreline erosion and erosion controls along the County's tidal shoreline, recent aerial photographs of the County's tidal shoreline area were analyzed. Areas experiencing active shoreline erosion were noted, as were shoreline erosion control structures. Shoreline erosion rates, however, were not determined. In general, the shoreline reaches along which active erosion was identified are characterized by exposure to a significant fetch. Artificial shoreline erosion control structures are concentrated in residential areas.

Guidance regarding appropriate responses to shoreline erosion has been provided by the Virginia Marine Resources Commission (VMRC) and by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance, which has endorsed a hierarchy of shoreline erosion control approaches established by the Hampton Roads Planning District Commission. The VMRC guidelines recommend that shoreline stabilization structures only be pursued where there is "active detrimental shoreline erosion which cannot be otherwise controlled" and that such structures be constructed in a manner that minimizes wetlands impacts. The County has recently incorporated the VMRC and Chesapeake Bay Local Assistance/Hampton Roads Planning District Commission guidance, by reference, into its Comprehensive Plan. The Wetlands Board should be advised of this policy guidance; ideally, the owners of property along the tidal shoreline should also be made aware of this policy, as well as other environmental policies and regulations affecting shoreline erosion controls.

The VMRC guidance does not provide a definition of "active detrimental shoreline erosion." The interpretation of this term, therefore, is a subjective one that is left to the applicable regulatory authority to make. Consideration should be given to developing a definition of this term that can be applied by the County's Wetlands Board in its reviews of shoreline stabilization proposals.

The Shoreline Situation Report that included an evaluation of Fairfax County's tidal shoreline was last produced by the Virginia Institute of Marine Science (VIMS) in 1979. While the

Northern Virginia Planning District Commission (now the Northern Virginia Regional Commission) published a document in 1992 that assessed shoreline erosion and erosion controls along the tidal shoreline of the County, the method of identifying shoreline erosion was based on map analyses rather than field studies. An update of the VIMS report based on field investigations would be useful in providing a current assessment of the conditions of the County's tidal shoreline.

SHORELINE EROSION CONTROL: RECOMMENDATIONS

35. Coordinate with State agencies, the Fairfax County Wetlands Board, and representative stakeholders, to develop recommended guidance for consideration by the Board of Supervisors regarding "active, detrimental shoreline erosion" for application as a County policy.

36. In coordination with State agencies, and contingent upon the availability of necessary resources, develop a process and related educational materials to ensure that tidal shoreline property owners are aware of information and advice pertaining to best shoreline stabilization practices as set forth and/or provided by the Virginia Institute of Marine Science, the Virginia Marine Resources Commission, and the Shoreline Erosion Advisory Service. As part of this effort, ensure that tidal shoreline property owners are provided information regarding the requirements of the Chesapeake Bay Preservation Ordinance, the Wetlands Zoning Ordinance, the Erosion and Sedimentation Control Ordinance and the Floodplain Regulations of the Zoning Ordinance.

37. Advise the Wetlands Board of the newly adopted policy regarding tidal shoreline erosion control/stabilization practices and request that Wetlands Board decisions be consistent with this policy.

38. Request that the Virginia Institute of Marine Science (VIMS) update the Shoreline Situation Report and the Tidal Shoreline Marsh Inventory for Fairfax County's tidal shoreline. Ideally, this effort would include the following:

    - Identify areas where tidal wetlands and riparian forest buffers adjacent to tidal wetlands can be restored;

    - Identify invasive plant species along the tidal shoreline and assist in developing ways to reduce invasive plant areas and restore native plants and submerged aquatic vegetation (SAV) to improve habit value and enhance water quality protection;

    - Conduct field studies of shoreline erosion rates along sensitive reaches of the County's shoreline in order to better characterize the nature and extent of shoreline erosion than is possible from a review of published reports and an analysis of aerial photography; and

- Conduct an analysis of physical conditions relating to shoreline erosion potential (e.g., soils, fetch, storm surge, slopes) along individual reaches of the County's tidal shoreline in order to characterize the susceptibility of each reach to erosion.

39. Continue to coordinate the review of all projects requiring approval of the County's Wetlands Board with the Department of Public Works and Environmental Services to ensure that all applicable regulatory requirements of the Chesapeake Bay Preservation Ordinance, the Erosion and Sedimentation Control Ordinance, and the Floodplain Regulations of the Zoning Ordinance are addressed and where appropriate that the applicant is aware of the need for additional permits and approvals. (Same as #40)

SHORELINE ACCESS

FINDINGS

Fairfax County is unique in Virginia with respect to the character of land use along its shoreline areas. Over 60% of the County's tidal shoreline is publicly owned, as is much of the shoreline of the nontidal Potomac River, much of the shoreline of the Occoquan Reservoir, and much of the County's network of stream valleys. Although there are some exceptions (notably Fort Belvoir), much of the publicly-owned shoreline is accessible to the public. A variety of recreational opportunities are provided at various parks in these areas, including hiking, bicycling, picnicking, sight seeing, bird watching, fishing, and boating. Further, the County has established an extensive stream valley park system as well as a substantial network of trails and has adopted Comprehensive Plan policy, and an associated Countywide Trails Plan, recommending a "comprehensive network of trails and sidewalks . . . as an integral element of the overall transportation network." While demand surveys identify a continued demand for environmental protection and passive (or "low impact") recreation opportunities, there are substantial opportunities for passive recreation along the County's shorelines.

A number of marinas are present along the County's tidal shoreline. Most of these marinas are equipped with sewage pump-out facilities, although such facilities are not required for the smaller marinas. It would be desirable to inform boaters of the marinas in the County that provide pump-out facilities and to advise owners and operators of the other marinas of funding opportunities that may arise that might cause them to consider constructing such facilities. It should be noted, however, that most operators of private marinas that have pump-out facilities only wish to offer the service to their own club or homeowners association members. The operators of these marina facilities do not wish to advertise their pump-out capabilities to the general boating population; typically, this is due to staffing and maintenance issues. Currently, only two marinas offer sewage pump-outs to the general boating public.

Private points of access to the County's tidal shoreline are concentrated in areas where residential development is adjacent to the shoreline; this pattern can be expected to persist into the future.

The 1990 Chesapeake Bay Public Access Plan highlighted a shortage of publicly-available boating access opportunities along the County's tidal shoreline, and it is likely, based on

continuing population growth in the County, that demand for such access has increased since that Plan was published. The siting of new publicly-accessible tidal shoreline boating access facilities will be limited substantially by the availability of property. Vacant and underutilized privately-owned properties are not prevalent along the tidal shoreline. In addition, many of these properties would not meet, or would have difficulty meeting, Zoning Ordinance standards for commercial marinas, docks, and boating facilities. Further, any proposal for a commercial or private/nonprofit marina, dock, or boating facility would require approval of either a Special Exception or a Special Permit; a broad range of environmental concerns, and possibly community concerns as well, would be considered in any such process.

While the pursuit of new boating access facilities along the County's shoreline will be limited by site availability issues, a broad suite of environmental considerations can be addressed for any proposed facility. Guidelines produced by the Virginia Marine Resources Commission and the Chesapeake Bay Program provide a template for the evaluation of the environmental suitability of any site for which such access may be proposed, and the County has recently incorporated this guidance, by reference, into its Comprehensive Plan. These guidelines can, therefore, be applied in any consideration of new boating access facilities by the Board of Supervisors or Board of Zoning Appeals. The Wetlands Board should be advised of this policy guidance; ideally, the owners of property along the tidal shoreline should also be made aware of this policy and other environmental policies and regulations affecting the shoreline area.

As noted earlier, a majority of the County's shoreline is publicly-owned. One or more public agencies may propose new boating access facilities along the tidal shoreline at some time in the future. While the County may not have approval authority over such decisions, it could, through the application of the policy referencing VMRC and Chesapeake Bay Program guidelines, seek to influence such decisions.

SHORELINE ACCESS: RECOMMENDATIONS

40. Continue to coordinate the review of all projects requiring approval of the County's Wetlands Board with the Department of Public Works and Environmental Services to ensure that all applicable regulatory requirements of the Chesapeake Bay Preservation Ordinance, the Erosion and Sedimentation Control Ordinance, and the Floodplain Regulations of the Zoning Ordinance are addressed and where appropriate that the applicant is aware of the need for additional permits and approvals. (Same as #39)

41. In coordination with State agencies, and contingent upon the availability of necessary resources, develop a process and related educational materials to ensure that tidal shoreline property owners are aware of information and advice pertaining to boating access best practices as set forth and/or provided by the Virginia Institute of Marine Science, the Virginia Marine Resources Commission, the Shoreline Erosion Advisory Service, and the Chesapeake Bay Program. As part of this effort, ensure that tidal shoreline property owners are aware of the requirements of the Chesapeake Bay Preservation Ordinance, the Wetlands Zoning Ordinance, the Erosion and Sedimentation Control Ordinance and the Floodplain Regulations of the Zoning Ordinance.

42. Advise the Wetlands Board of the newly adopted policy regarding tidal shoreline access structures and request that Wetlands Board decisions be consistent with this policy.

43. Ensure that any new marinas that are constructed in Fairfax County will be fully in compliance with Chapter 570, Sanitary Regulations for Marinas and Boat Moorings, as promulgated by the Virginia Department of Health of the Commonwealth of Virginia. This Chapter implements the federal Clean Vessel Act through the Virginia Marina Program.

44. As funding opportunities arise, advise owners and operators of marinas that are exempt from sanitary waste pump-out facility requirements of funding opportunities that may be available to provide such facilities.

45. Contingent on the availability of necessary resources, pursue an outreach program in order to ensure that boaters are made aware of the available marina facilities in the County that are registered by the Commonwealth, that maintain current certificates to operate, and that have sanitary waste pump-out facilities that are available for general public use. ■